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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/077,345	02/15/2002	Roger L. Haskin	POU920020010US1	2492

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EXAMINER	
CHANNAVAJJALA, SRIRAMA T	
ART UNIT	**PAPER NUMBER**
2177	5

DATE MAILED: 07/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/077,345	HASKIN ET AL.
	Examiner	Art Unit
	Srirama Channavajjala	2177

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 February 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The Drawings filed on 6/3/2002 are acceptable for examination purpose.

Information Disclosure Statement

2. The information disclosure statement filed on 1/26/2004, paper no. # 4 is in compliance with the provisions of 37 CFR 1.97, and has been considered and a copy was enclosed with this Office Action. [see paper no. # 5].

Specification

3. At page 1, the cross-reference to related application serial number are missing, further applicant is hereby required to provide related application serial numbers and their updating status in response to this office action, paper no.5.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164

USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

5. Claim 1-26 provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-27 of copending Application No. 10/077,246, Claims 1-34 of co-pending Application No. 10077,320.

6. Claims 1-26 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-27 of co pending Application No. 10/077,246, is now US Pub.No. 2003/0158873, Claims 1-34 of co pending Application No. 10/077,320 is now US Pub.No.2003/0158862. Although the conflicting claims are not identical, they are not patentably distinct from each other because in the present application Independent Claims directed to file system snapshot, more specifically generating a a snapshot dataset...., copying to a shadow inode in the snapshot dataset....., identifying most recent snapshot dataset and like, while claims in the co-pending Application 10/077, 246, is now US Pub.No. 2003/0158873, 10/077,320 is now US Pub.No.2003/0158862 are directed at least part of generating, file system snapshot, and other related limitations. Accordingly, the instant Claims are very broad and within the scope of the Claims of the

Application No. Application 10/077, 246, is now US Pub.No. 2003/0158873, 10/077,320 is now US Pub.No.2003/0158862.

This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claim 1-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Kazar et al., [hereafter Kazar], US Pub.No. 2002/0112022.

8. As to Claim 1,7, 13, 19,Kazar teaches a system which including 'providing a file system snapshot' [see page 6, col 2, 0100], file system snapshot corresponds to Kazar's file system snapshot as described in page 6, 0100, further it is also noted that Kazar specifically directed to volume replication for making clone that creates snapshot of the volume as detailed in page 5, col 1, 0082; 'generating a snapshot dataset for a source file in a file system, wherein the snapshot dataset is substantially empty' [page 5, col 1, 0082,0084, fig 1], source file in a file system corresponds to fig 1, NFS server, generating snapshot dataset corresponds to creating a point in time snapshot of that volume as

detailed in page 5, col 1, 0082, snapshot dataset is substantially empty corresponds to propagating changes or update changes of a clone to remote sites by only sending the data blocks that have changed since the last replica was propagated as detailed in page 5, col 1, 0084; 'copying to a shadow inode in the snapshot dataset an inode corresponding to the source file, when only metadata of the source file is modified, wherein a disk address of a data block corresponding to the source file is not copied to the shadow inode' [page 1, col 2, 0020-0021, page 4, col 1, 0073, page 5, col 1, 0085, fig 1,fig 8-9], Kazar is directed to vnode operations layer, more specifically vnode, inode operations in a file system structure as detailed in fig 1, Kazar also specifically directed to copy-on-write operations to create cloned inodes [see page 1, col 2, 0020], disk address of a datablock corresponding to disk block addresses that are associated with bit information of copy on write operations [see page 4, col 1, 0071].

As best understood by the examiner, shadow inode is created when a file is opened, in other words, when copy-on write operations are performed, further, a copy is made of the original inode, pointing to the same data and indirect blocks, therefore, the shadow thus refers to the same data as the original, but is not yet referred to by any directory. It is however, noted that operations on the file use the shadow inode because each time the file is modified, or updated, a copy is made of the target block, further, the copy replaces the original in the shadow version of the file and modifications are made to the copy of the file. In order to make sure each respective block is copied, a copy on write bit is

associated with each block pointer whether direct or indirect [see Kazar: page 1, col 2, 0021]. Because copy on write bit is associated with each data block pointer, it is normally set to zero, however, it may bit may also set to "1" when the data block is modified or copied, further if a change is made to specific data block and respective copy on write bit is already set to "1", no further copying is necessary [see page 4, col 1, 0073]. It is however, should be noted that this applies to indirect blocks, when they are modified, a copy is made for the shadow version of the file

9. As to Claim 2, 8, 14, 20,most of the limitations of this claim have been noted in the rejection of Claim 1 above. In addition, with respect to the claimed feature Kazar disclosed 'copying to the shadow inode in the snapshot dataset the inode corresponding to the source file, when the data block corresponding to the source file is only appended, wherein the disk address of the data block corresponding to the source file is not copied to the shadow inode' [page 1, col 2, 0020-0021, page 4, col 1, 0073, page 5, col 1, 0085, fig 1,fig 8-9].

10. As to Claim 3, 9, 15,most of the limitations of this claim have been noted in the rejection of Claim 2 above. In addition, with respect to the claimed feature Kazar disclosed 'copying to the shadow inode in the snapshot dataset the inode corresponding to the source file and copying to the snapshot dataset the data block corresponding to the source file, when the data block corresponding to the source file is overwritten or deleted, wherein the shadow inode includes disk

address of the data block which was written in the snapshot dataset' [page 4, col 1, 0074, col 2, 0079-0080], Kazar specifically teaches file delete operations does all disk blocks in the indirect block tree associated with the file being deleted as detailed in page 4, col 2, 0079.

11. As to Claim 4, 10, 16,most of the limitations of this claim have been noted in the rejection of Claim 3 above. In addition, with respect to the claimed feature Kazar disclosed 'accessing a shadow inode corresponding to a source file' [page 2, col 1, 0022]; 'determining whether the shadow inode includes a disk address' [page 3, col 2, 0060,0068]; 'wherein if the shadow inode includes a disk address, then reading a data block referenced by the disk address' [page 3, col 2, 0068]; 'wherein if the shadow inode does not include a disk address, then retrieving an inode of the source file and retrieving a data block referenced by a disk address in the inode of the source file' [page 4, col 1, 0071]

12. As to Claim 5, 11,17, most of the limitations of this claim have been noted in the rejection of Claim 3 above. In addition, with respect to the claimed feature Kazar disclosed 'copying to the shadow inode in the snapshot dataset the inode corresponding to the source file and copying to the snapshot dataset the data block corresponding to the source file, when the data block corresponding to the source file is overwritten or deleted, wherein the shadow inode includes disk address of the data block which was written in the snapshot dataset' [page 4, col 1, 0074, col 2, 0079-0080], Kazar specifically teaches file delete operations

does all disk blocks in the indirect block tree associated with the file being deleted as detailed in page 4, col 2, 0079; 'wherein the indirect block includes a disk address of at least one data block which was written in the snapshot dataset' [page 1, col 2, 0021].

13. As to Claim 6, 12, 18,most of the limitations of this claim have been noted in the rejection of Claim 5 above. In addition, with respect to the claimed feature Kazar disclosed 'accessing a shadow inode corresponding to a source file' [page 2, col 1, 0022]; 'determining whether the shadow inode includes a disk address' [page 3, col 2, 0060,0068]; 'wherein if the shadow inode includes a disk address, then retrieving an indirect block referenced by the disk address and at least one data block defined by at least one disk address in the indirect block' [page 1, col 2,0021, page 3, col 2, 0068]; 'wherein if the shadow inode does not include a disk address, retrieving an inode of the source file, then retrieving an indirect block referenced by a disk address in the inode of the source file and retrieving at least one data block referenced by at least one disk address in the indirect block' [page 4, col 1, 0071, page 5, col 1, 0083].

14. As to Claim 21,most of the limitations of this claim have been noted in the rejection of Claim 20 above. In addition, with respect to the claimed feature Kazar disclosed 'a data block corresponding to the source file in the snapshot dataset, wherein the data block is copied to the snapshot dataset when the original data block is over written' [page 4, col 1, 0070, 0075]; 'a shadow inode in

the snapshot dataset, the shadow inode copied from an inode corresponding to the source file, wherein the shadow inode is generated when the data block corresponding to the source file is overwritten or deleted and wherein the shadow inode includes a disk address of the data block which was written in the snapshot dataset'[page 4, col 1, 0074, col 2, 0079-0080].

15. As to Claim 22,most of the limitations of this claim have been noted in the rejection of Claim 21 above. In addition, with respect to the claimed feature Kazar disclosed 'a shadow inode corresponding to a source file' [page 2, col 1, 0025]; 'a disk address included in the shadow inode' [page 3, col 2, 0068], Kazar specifically suggests inode points to a data blocks by gibing their address as detailed in 0068, line 1-2; 'a data block referenced by the disk address' [page 3, col 2, 0068]; 'an inode of the source file' [see fig 1-2]; 'a data block referenced by a disk address in the inode of the source file' [page 3, col 2, 0068, page 4, col 1, 0071].

16. As to Claim 23,most of the limitations of this claim have been noted in the rejection of Claim 21 above. In addition, with respect to the claimed feature Kazar disclosed a shadow inode corresponding to a source file' [page 2, col 1, 0025]; 'a disk address included in the shadow inode' [page 3, col 2, 0068], Kazar specifically suggests inode points to a data blocks by gibing their address as detailed in 0068, line 1-2; 'an indirect block referenced by the disk address' [page 1, col 2, 0021]; 'at least one data block defined by at least one disk

address in the indirect block' [page 4, col 1, 0071]; 'an inode of the source file' [see fig 1-2]; 'an indirect block referenced by a disk address in the inode of the source file' [page 3, col 2, 0068, page 4, col 1]; 'at least one data block referenced by at least one disk address in the indirect block' [page 4, col 1, 0071].

17. As to Claim 25-25, Kazar teaches a system which including 'determining the existence of an older snapshot' [page 5, col 1, 0081]; 'wherein if there is an older snapshot, determining the existence of a reference in the older snapshot in an inode or a data block in the first snapshot' [page 4, col 1, 0075]; 'wherein if there is no older snapshot, deleting any inode or data block in the first snapshot' [page 4, col 2, 0079].

18. Claim 26 is rejected under 35 U.S.C. 102(e) as being anticipated by Lewis et al., [hereafter Lewis], US Pub.No. 2002/0083037.

19. As to Claim 26, Lewis teaches a system which including 'wherein if there is a most recent snapshot, the most recent snapshot not being the first snapshot, copying to the most recent snapshot any inode data block in the file system referenced by the most recent snapshot which shall be modified by the restoration of the first snapshot' [see Abstract, col 2, especially line 26-43], most recent snapshot corresponds to Lewis's most recently created snapshot; 'wherein if there is an inode or a data block in the first snapshot, copying the

inode or data block in the first snapshot to the file system' [page 4, col 1, 0058, page 3, col 2, 0050, page 5, col 2, 0096]; 'wherein if there is a ditto disk address in the first snapshot, copying the inode or data block referenced by the ditto disk address to the file system' [page 4, col 2, 0063-0064].

Conclusion

The prior art made of record

a.	US Pub. No.	2002/0112022
b.	US Pub.No.	2002/0083037

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure

c.	US Patent No.	6341341
d.	US Patent No.	6205450
e.	US Patent No.	5764972
f.	US Patent No.	6038639
g.	US Patent No.	6654912
h.	US Patent No.	6173293
j.	US Pub.	2003/0158873
k.	US Pub.	2003/0158862
l.	US Pub.	2003/0140204
m.	US Patent No.	6484186

n. US Patent No. 5991771

o. US Patent No. 5678042

p. US Pub. 2003/0140070

q. Douglas et al., « Deciding when to forget in the elephant file syste, 17th ACM Symposium on operating systems principles SOSP, 1999 ACM pp110-123

r. Vitor Santos Costa, LIACC & DCC-FCUP, "COWL: Copy-on-write for logic programs pp 1-8

s. HITACHI data systems, "Hitachi quickshadow copy-on-write snapshot software, 2004 4 pages

t. LSI LOGIC STORAGE SYSTEMS "snapshot feature" © 2002 2 pages

u. Snap Appliance Technology Brief, © 2004 rev.2 4 pages

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Srirama Channavajjala whose telephone number is (703)308-8538. The examiner can normally be reached on Monday-Friday from 8:00 AM to 5:30 PM Eastern Time. The TC2100's Customer Service number is (703)306-5631.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Breene, can be reached on (703)305-9790. The fax phone numbers for the organization where the application or proceeding is assigned are as follows:

703/746-7238	**(After Final Communication)**
703/872-9306	**(Offical Communications)**
703/746-7240	**(For Status inquiries, draft communication)**

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703)305-9600.

sc
Patent Examiner.
June 24, 2004.